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Monterey, California



INTRINSIC MOTIVATION IN THE MILITARY: MODELS AND STRATEGIC IMPORTANCE

by

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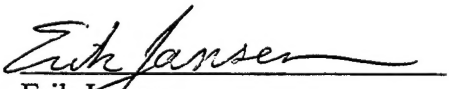
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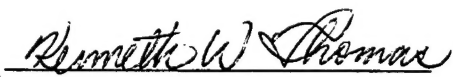
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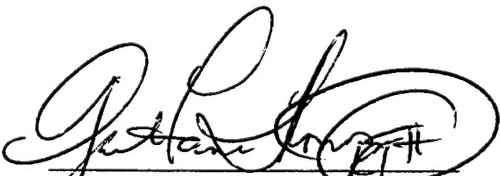
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In this report, prepared for the Eighth Quadrennial Review of Military Compensation, intrinsic task motivation is related to self-management, a set of problem solving behaviors corresponding to the requirements specified for twenty-first century military personnel. Intrinsic task motivation refers to the psychological rewards that individuals derive directly from their work tasks. An integrative theory presents four types of intrinsic rewards: senses of meaningfulness, choice, competence, and progress. These rewards correspond to four types of decision-making behaviors that define self-management: committing to a meaningful purpose, choosing activities to accomplish this purpose, monitoring the quality/competence of one's activities, and monitoring one's progress toward the purpose. Self-management is contrasted with micro-management: the dominant style of the traditional or "old school" of management. Intrinsic motivation and self-management are more congruent with the military's strategic human resource requirements in the twenty-first century, as exemplified by Total Quality Management, Force XXI, and the U.S. Army as a learning organization. The potential benefits of intrinsic task motivation and self-management include, at the individual level, flexibility, adaptation, responsiveness, innovation, learning, and satisfaction. These, in turn, are expected to lead to enhanced retention and readiness, at individual and unit levels.

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TABLE OF CONTENTS

	<u>Page</u>
ABSTRACT	i
TABLE OF CONTENTS	ii
LIST OF TABLES	iii
LIST OF FIGURES	iv
 I. OVERVIEW AND PURPOSE	 1
 II. SELF-MANAGEMENT IN THE PRIVATE SECTOR	 2
A. Traditional ("Old School") Management.....	3
B. The Emerging View of Management	4
 III. DEVELOPMENTS IN THE MILITARY	 6
A. Total Quality Management.....	6
B. U.S. Army: Force XXI	7
C. U.S. Army: Learning Organization	8
 IV THE INCREASING NEED FOR INTRINSIC MOTIVATION	 9
 V. INTRINSIC MOTIVATION	 9
A. Intrinsic Task Motivation	9
B. What is a Task	11
C. Previous Theories of Intrinsic Motivation.....	11
1. Cognitive Evaluation Theory	11
2. The Job Characteristics Model.....	12
D. An Integrative Theory	13
 VI. RELATIONSHIP OF INTRINSIC MOTIVATION TO SELF MANAGEMENT	 15
 VII. POTENTIAL EFFECTS OF INTRINSIC MOTIVATION IN THE MILITARY	 18
A. Individual-Level Effects.....	19
B. Unit-Level Effects.....	21
C. Organization-Level Effects.....	21
D. Final Comments and Recommendations	22
 REFERENCES	 23
 ENDNOTES.....	 26
 DISTRIBUTION LIST	 27

LIST OF TABLES

	<u>Page</u>
1. The Paradigm Shift in Management.....	2
2. Previous Theories of Intrinsic Motivation	12
3. Integrative Model of Intrinsic Motivation.....	14

LIST OF FIGURES

	<u>Page</u>
1. Intrinsic Task Rewards	10
2. Intrinsic Task Motivation and Self-Management: A Self-Reinforcing Cycle	16
3. The Self-Management Process	17
4. Potential Effects of Intrinsic Motivation in the Military	19

I. OVERVIEW AND PURPOSE

Briefly, intrinsic motivation has to do with the "psychological compensation" that individuals receive from their work. It is distinguished from extrinsic motivation, which includes economic rewards. There is a great deal of evidence that intrinsic motivation is an important factor in military attrition and retention. For example, Gibb, Nontasak and Dolgin (1988) found that the top ten factors influencing the retention of Naval aviators involved intrinsic factors. Nevertheless, intrinsic motivation has been understudied in comparison with economic factors¹. A major reason is that intrinsic motivation has been a relatively vague notion, needing clear definitions and a comprehensive model to guide analysis and action recommendations. Another problem is that the topic has been surrounded by oversimplified myths. In particular, some influential writings have argued that intrinsic motivation and extrinsic motivation are incompatible (Deci, 1971; Deci & Ryan, 1987; Kohn, 1993). However, a recent, rigorous review of empirical research indicates that the two often facilitate each other (Cameron & Pierce, 1994).

This paper attempts to provide a clear model of intrinsic motivation and uses this model to explore the strategic importance of intrinsic motivation to the U.S. military. An important part of the paper involves clarifying the intimate relationship between intrinsic motivation and individual self-management, as well as identifying the ways in which warfare is requiring increasing degrees of self-management.

II. THE INCREASING IMPORTANCE OF SELF-MANAGEMENT IN THE PRIVATE SECTOR

Management changes within the military occur against the backdrop of a profound shift in management practice in the private sector. Traditional management practices had their roots in the industrial era that bloomed early in the twentieth century. As this century ends, management practices are shifting to cope with the post-industrial or information era. Key aspects of the two approaches to management are shown in Table 1. These changes in management practice are responses to the changing demands faced by organizations during these periods. They also incorporate dramatic changes in psychological views regarding workers.

Table 1: The Paradigm Shift in Management

	"OLD SCHOOL" (Command and Control)	"EMERGING VIEW" (Collegial)
MANAGER'S ROLE	Directing and Controlling	Leadership and Coaching
WORKER'S ROLE	Compliance	Self-management
WORKER'S MOTIVATION	Mostly extrinsic <ul style="list-style-type: none">• No Commitment to task• Responds to carrots and sticks controlled by management	Mostly intrinsic <ul style="list-style-type: none">• Committed to task• Gets rewards directly from doing the task well

A. Traditional ("Old School") Management

The traditional management approach was developed largely to deal with mass production organizations, as epitomized by the U.S. automobile industry early in the century. These organizations faced relatively predictable, certain environments in which they could develop elaborate, programmed procedures to take advantage of operating efficiencies. This kind of predictability allowed coordination through the hierarchy, with centralized decision making by managers (Galbraith, 1977). Predictable production lines allowed jobs to be highly specialized and repetitive, requiring minimal worker training. Following principles of scientific management ("Taylorism"), innovations in job design were made by staff engineers rather than by workers.

With managers making decisions, workers' roles were defined primarily in terms of behavioral compliance with the directions of managers. That is, workers usually were discouraged from thinking and making decisions. Managers were micro-managers who exercised close controls to ensure that workers performed activities as directed. Compliance was enforced primarily through extrinsic, economic rewards and punishments controlled by the manager -- wages and layoffs.

This treatment of workers was consistent with the dominant psychological models of the era. Skinner and other "behaviorists" maintained that observable behavior-- not cognition (thinking)--was the only legitimate subject matter of

psychology. Moreover, they asserted that an individual's behavior could be explained entirely by external stimuli—namely, extrinsic rewards and punishments (reinforcements).

B. The Emerging View of Management

Contemporary management operates in a quite different environment. Led by rapid advances in telecommunications and information processing technologies, the pace of change has escalated exponentially. A relatively stable environment has been replaced by what one management writer has called "permanent whitewater" (Vail, 1996). The world also has become smaller and more competitive: organizations now shop internationally for suppliers and compete internationally for customers. In this international market place, firms compete on the basis of product and service quality (as viewed by the individual customer), speed of delivery, innovation, speed of product development, and customization to meet the needs of individual customers.

In this uncertain, turbulent environment, centralized decision making has become too slow to coordinate the bulk of operating issues. Organizations operate in a more decentralized fashion, with workers and subunits given more autonomy to deal with the local conditions they encounter. Organizations have flattened themselves by eliminating unnecessary layers of management that slow communications and decision making. Coordination between units often is handled through cross-functional (horizontal) relationships—often on an informal and *ad hoc* basis. Telecommunications and information processing technologies make it possible for individuals and subunits

to have real-time access to the information they need for decision making and provide communication networks for coordination.

In contemporary organizations, then, workers take on much of the decision making and problem solving formerly performed by managers. They more typically use their own judgment to choose the proper procedures for dealing with conditions they encounter, adapt those procedures as needed, and coordinate as necessary. Although a number of words have been used to describe this new role, the term "self-management" appears to best capture the new task requirements. The manager's role, in turn, has shifted from micro-manager to leader and coach. Management fosters work values and develops a vision, thus providing direction and purpose. Management facilitates development of workers' abilities, as well as resource acquisition and coordination — horizontal and vertical — with other individuals and subunits. Management creates a context whereby individuals and groups are able to manage themselves.

Understanding the new role of workers has been helped by developments in psychology. In contrast to the behaviorism at the early part of this century, psychological explanations of behavior are now more cognitive. Individuals are no longer seen as simply reacting to external events in their environment. Rather, a great deal of knowledge has accumulated about how individuals interpret those events and make decisions to guide their behavior. Recent emphasis has been upon the manner in which individuals are self-regulating—how they set goals and intentions, monitor their goal attainment, judge their self-efficacy, and learn (Bandura, 1988; Kanfer, 1990;

Locke & Latham, 1990). The notion that individuals become increasingly self-managing is now central to our notions of development and maturity (Argyris and Schön, 1974; Piaget, 1950; Piaget, & Inhelder, 1969).

III. DEVELOPMENTS IN THE MILITARY

Changes in military management appear to have lagged somewhat behind those of the private sector. However, with the decline of the former Soviet Union, the changing mission of the military, and declining funding, the U.S. armed forces have entered an era of intense change at the close of the twentieth century. The branches of the armed forces have acknowledged the need for more flexible, rapidly deployable units, the need to capitalize on information technology, and the need to accomplish more with fewer people (e.g., Force 2001, 1995; Force XXI, 1994).

A. Total Quality Management

As one response to these environmental demands, the Department of Defense (DOD) has officially adopted total quality management (TQM) as a management philosophy. The work of W. Edwards Deming (Deming, 1986; Walton, 1990) is a core foundation for TQM, and the Department of the Navy has based its approach, Total Quality Leadership (TQL), explicitly upon Deming. In this respect, DOD has formally endorsed some of the key management precepts adopted by the private sector.

Deming, for example, strongly advocates the need to harness workers' intelligence and intrinsic motivation, giving them a key role in the continuous process improvement that drives increases in speed and quality, and reductions in waste. At this point, TQM/TQL is gradually being implemented in the services.

B. U.S. Army: Force XXI

The U.S. Army has been especially explicit about its evolving management principles. Force XXI (1994) spells out current doctrine with respect to changing environmental realities, acknowledging that "change will continue, requiring our Army to recognize it as the only real constant" (p. 1-1). Moreover, in the developing information age,

[the] main imperative guiding future operations, from full war to domestic support operations, will be to gain information and continued accurate and timely shared perceptions of the battlespace. . . By mastering information, we can potentially command operations at an informational tempo no potential enemy can match (pp. 3-2 & 3-3).

As in the private sector, these demands imply the need for individuals to exercise self-management. Future battle command will start with soldiers "with initiative, soldiers who contribute to the overall intent far in excess of their numbers because they are continuously informed" (p. 3-4).

Force XXI spells out the need for different management approaches that reduce micro-management. Army organizations will become "flatter and less rigidly hierarchical" (p. 3-2). Battle command systems inevitably will include "both hierarchical and nonhierarchical, or internetted, information processes" (p. 3-4). New intelligence architecture will "empower . . . subordinates to better use resources and coordinate efforts at the lowest tactical levels" (p. 3-8). The following excerpts capture implications for leadership:

Future leaders must understand the changing nature of the legitimacy of command authority. While position and rank . . . will still provide command authority, authority gained heretofore by possession of more

information will change. Leaders must exploit the potential to be found in military organizations that are flatter, interconnected, and where quality soldiers with expanded and timely information are able to reach their full potential for initiative and action within the overall intent when given that opportunity. (p. 4-4)

Future Army leaders . . . cannot use [command] systems to second-guess or interfere with the command prerogatives of subordinate commanders. (p. 4-4)

[Shared information], where, in some cases, subordinates have as much information as commanders, changes the dynamics of leader-to-led in ways yet to be fully explored and exploited. (p. 3-5)

C. U.S. Army: Learning Organization

The Army's evolving management philosophy also is reflected in ex-Chief of Staff, General Gordon R. Sullivan's designation of the Army as a learning organization.

General Sullivan (1994) described the importance of a "positive command climate" in which "leaders and led enjoy open and honest dialogue, and all contribute willingly to accomplishing the mission" (p. 2). He also emphasized the importance of giving subordinates room to demonstrate initiative by taking prudent risks and learning from mistakes (p. 4). He explicitly warned against control-oriented, "zero-defects" climates that punish all mistakes and drive out initiative and learning. He noted that the Army's institutionalization of the After Action Review (AAR) process typifies the new philosophy:

We have all seen AARs in which generals and privates freely exchanged views of a particular task or mission, with each respectfully deferring to the other's perspectives and expertise, and each open to hearing the other's views—and all focused on doing the mission as well as possible. That is the way to learn from what we do. You can trace a direct line from our AARs to victories in Panama, Southwest Asia, and other operations. (p. 2)

IV. THE INCREASING NEED FOR INTRINSIC MOTIVATION

As any organization relies less on micro-management and compliance, and requires more judgment, commitment, and self-management from its personnel, the intrinsic motivation of workers becomes a more important factor in performance. This point has been emphasized by an impressive number of management researchers and consultants (Deming, 1986; Lawler, 1986, 1992; Senge, 1990; Walton, 1985; Manz, 1991). However, as noted earlier, the theoretical foundation for this conclusion has often been vague or implicit. In the next sections, we attempt to more clearly specify the concept of intrinsic motivation and to detail its relationship to self-management.

V. INTRINSIC MOTIVATION

A. Intrinsic Task Motivation

The concept of intrinsic motivation has been somewhat ambiguous in part because it was not clear to what the word "intrinsic" referred. As used by some writers, "intrinsic" has meant intrinsic to the individual—that is, psychological. As used by others, it has meant intrinsic to the task being performed by an individual. Following Thomas and Velthouse (1990), we believe that the most useful definition involves both meanings. That is, intrinsic motivation involves psychological rewards that individuals derive directly from a task.

Figure 1 helps to clarify what is included in this definition—and what is excluded. The central portion represents intrinsic task motivation, which is based on psychological rewards received from a task. These rewards are derived from task

performance and serve to motivate continued task performance. As noted above, they are the focus of this paper and will be discussed in more detail below.

Intrinsic task rewards usually are contrasted with extrinsic task rewards. The latter are task-contingent rewards given to an individual by others. They include economic rewards like pay-for-performance, as well as recognition, praise, commendations and awards. They are another factor in motivating task performance.

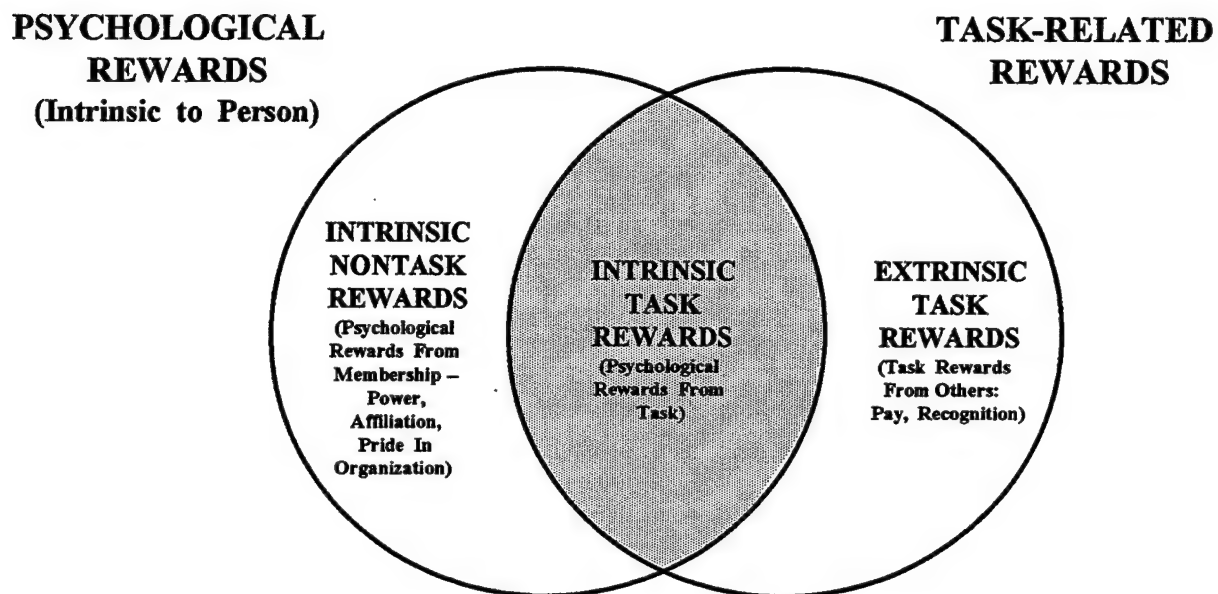


Figure 1. Intrinsic Task Rewards

Intrinsic task rewards also can be distinguished from intrinsic nontask rewards. These are psychological rewards that are not directly associated with a task. For example, an individual might experience a sense of pride in belonging to his/her branch of the military, satisfy social needs from interacting with other unit members, feel comfortable with aspects of military life, or satisfy power or status needs within the unit. These can be considered psychological "membership" rewards. That is, the individual

receives them from being present in the organization, but not from performing the task itself. Thus, while they are unlikely to be a factor in motivating task performance and self-management, they still are likely to be significant factors in membership decisions: joining, participating, attriting, transferring, and reenlisting.

B. What is a Task?

Because intrinsic motivation is being defined in terms of intrinsic task motivation, it is important to clarify what a task is. Following Thomas and Velthouse (1990, p. 668), "task refers to a set of activities directed toward a purpose." Note that tasks include both the activities (behaviors) to be performed and the purposes (missions, goals) served by those activities. Intrinsic task rewards, then, come from both task activities and task purposes.

C. Previous Theories of Intrinsic Motivation

The two theories of intrinsic motivation that have been most widely used are described in Table 2. As shown in the Table, each theory has focused on a different component of task (activities vs. purpose) in attempting to identify the nature of intrinsic motivation.

1. Cognitive Evaluation Theory

This theory, and the experiments on which it is based, emphasizes task activities as the source of intrinsic motivation, and omits the importance of significant task purposes (Deci, 1975; Deci & Ryan, 1987). As a result, the theory seems most applicable to games and to understanding what makes activities enjoyable or fun for

Table 2. Previous Theories of Intrinsic Task Motivation

FOCUS	THEORISTS	THEORY	CONTENT
Task Activities	Deci & Ryan ¹	Cognitive Evaluation Theory	Feedback and Rewards Shape Levels of Experienced Choice (Self-Determination) and Competence
Task Purpose	Hackman & Oldham ²	Job Characteristics Model	Five Characteristics of Job Design Shape Experienced Meaningfulness, Causal Responsibility for Task Outcomes, and Knowledge of Outcomes

¹Deci, E. L., & Ryan, R. M. (1985). *Intrinsic Motivation and Self-Determination in Human Behavior*. New York: Plenum.

²Hackman, J.R., & Oldham, G.R. (1980). *Work Redesign*. Reading, MA: Addison-Wesley.

their own sake. It has been widely applied in education to explain what makes learning interesting. The theory identifies two elements of intrinsic motivation from task activities: experienced self-determination (choice) and experienced competence. Research on the theory has emphasized the manner in which feedback and extrinsic rewards shape these feelings.

2. The Job Characteristics Model

This approach to intrinsic motivation emphasizes the importance of the purpose or intended outcomes of a task as the source of intrinsic rewards. The job characteristics model (Hackman & Oldham, 1980) has been widely researched in organizational settings and is the successor to Herzberg's dual-factor theory (Herzberg, 1966), which did not hold up well in testing (e.g., House & Wigdor, 1967). In the job

characteristics model, workers are assumed to feel good about their work when they experience three psychological states: meaningfulness of the work, causal responsibility for work outcomes (based on their autonomy or choice), and knowledge of those outcomes. The theory focuses on the manner in which these psychological states are shaped by five aspects of job design (job characteristics): task significance, skill variety, task identity, autonomy, and feedback. Research suggests that these five job characteristics do impact motivation through the three psychological states, although more research is needed (Kanfer, 1990). Research support also strongly indicates that the five job characteristics impact job satisfaction (Loher, Noe, Moeller, & Fitzgerald, 1985), which in turn reduces turnover and absenteeism (e.g., Mowday, Porter, & Steers, 1982).

D. An Integrative Theory

Table 3 shows a more recent theory of intrinsic motivation that integrates insights from both previous theories (from Thomas & Tymon, 1993, 1995). It will be used throughout the remainder of this paper.

This theory identifies four distinct intrinsic rewards that individuals can receive from work tasks: senses of choice, competence, meaningfulness and progress. Choice and competence are asserted to come from task activities—as in cognitive evaluation theory. Meaningfulness and progress, in contrast, have to do with the task purpose—as in the job characteristics model. (Progress is equivalent to positive knowledge of outcomes.) As shown in Table 3, moreover, competence and progress

are senses of accomplishment—how well one is performing task activities and attaining the task purpose, respectively. Choice and meaningfulness, in contrast, are rewarding senses of task opportunity—being able to use one's own judgment and to pursue a worthwhile purpose, respectively.

Table 3. An Integrative Model of Intrinsic Task Motivation

	OPPORTUNITY ELEMENTS	ACCOMPLISHMENT ELEMENTS
TASK <u>ACTIVITIES</u>	Sense of CHOICE	Sense of COMPETENCE
TASK <u>PURPOSE</u>	Sense of MEANINGFULNESS	Sense of PROGRESS

Source: Adapted from Thomas & Tymon, Empowerment Inventory (NY: XICOM, 1993)

The four intrinsic rewards are described below (Thomas & Tymon, 1993, p. 9):

Choice is the opportunity you feel to select task activities that make sense to you and to perform them in ways that seem appropriate. The feeling of choice is the feeling of being free to choose—of being able to use your own judgment and act out of your own understanding of the task.

Competence is the accomplishment you feel in skillfully performing task activities you have chosen. The feeling of competence involves the sense that you are doing good, quality work on a task.

Meaningfulness is the opportunity you feel to pursue a worthy task purpose. The feeling of meaningfulness is the feeling that you are on a path that is worth your time and energy—that you are on a valuable mission, that your purpose matters in the larger scheme of things.

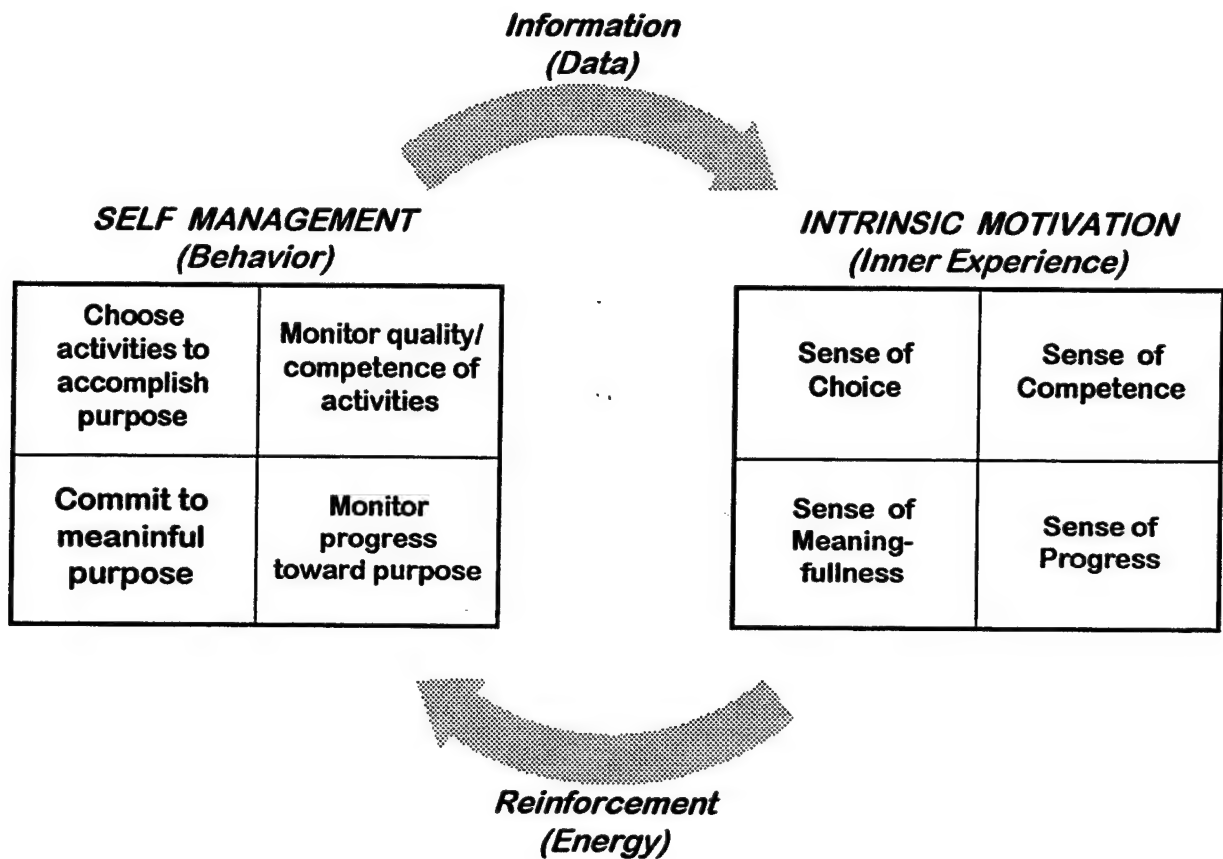
Progress is the accomplishment you feel in achieving the task purpose. The feeling of progress involves the sense that the task is moving forward, that your activities are really accomplishing something.

While relatively new, there is significant empirical support for the integrated model—although thus far none from military settings. Reliable questionnaire measures of the four elements of intrinsic motivation have been developed (Thomas & Tymon, 1993; Spreitzer, 1995). Results show that the four elements are distinct, and that they are related to such outcome measures as job satisfaction, performance, innovativeness, commitment to the organization, and reduced stress symptoms (cf. references in Thomas & Tymon, 1995).

VI. RELATIONSHIP OF INTRINSIC TASK MOTIVATION TO SELF-MANAGEMENT

Figure 2 depicts the reciprocal relationship between intrinsic motivation and self management. As discussed above, intrinsic motivation (indicated on the right side of the diagram) refers to the individual's inner experience of choice, competence, meaningfulness, and progress. Self-management (indicated on the left side of diagram), on the other hand, refers to decision-making behavior. In the Figure, self management is broken down into four behaviors that parallel the elements of intrinsic motivation: choosing activities to accomplish one's purpose, monitoring the quality/competence of one's activities, committing to a meaningful purpose, and monitoring one's progress toward the purpose. Note that these behaviors also are

characteristics by which we judge individuals to be responsible, mature, or trustworthy on the job.



**Figure 2. Intrinsic Task Motivation and Self-Management:
A Self-Reinforcing Cycle**

As shown in the Figure, self-management behaviors provide information or data from which individuals make interpretations to determine their sense of choice, competence, meaningfulness, and progress. These inner experiences of intrinsic motivation, which are inherently rewarding to the individual, then serve to reinforce or energize continued self-management behavior. In this manner, high levels of self management and intrinsic motivation can produce self-reinforcing positive cycles—with individuals becoming increasingly self-managing and energized by their tasks.

Likewise, low levels of self-management and intrinsic motivation can produce self-reinforcing negative cycles in which individuals are turned off by their tasks (demotivated) and exhibit increasingly passive or irresponsible behavior.

Figure 3 organizes the four decision-making behaviors from Figure 2 into a model of the self-management process. Overt performance of task activities is shown in the oval. The decision-making behaviors, shown in rectangles, direct the performance toward purposeful accomplishment – the essence of self-management. (For each decision-making behavior, we have underlined the associated intrinsic task reward.)

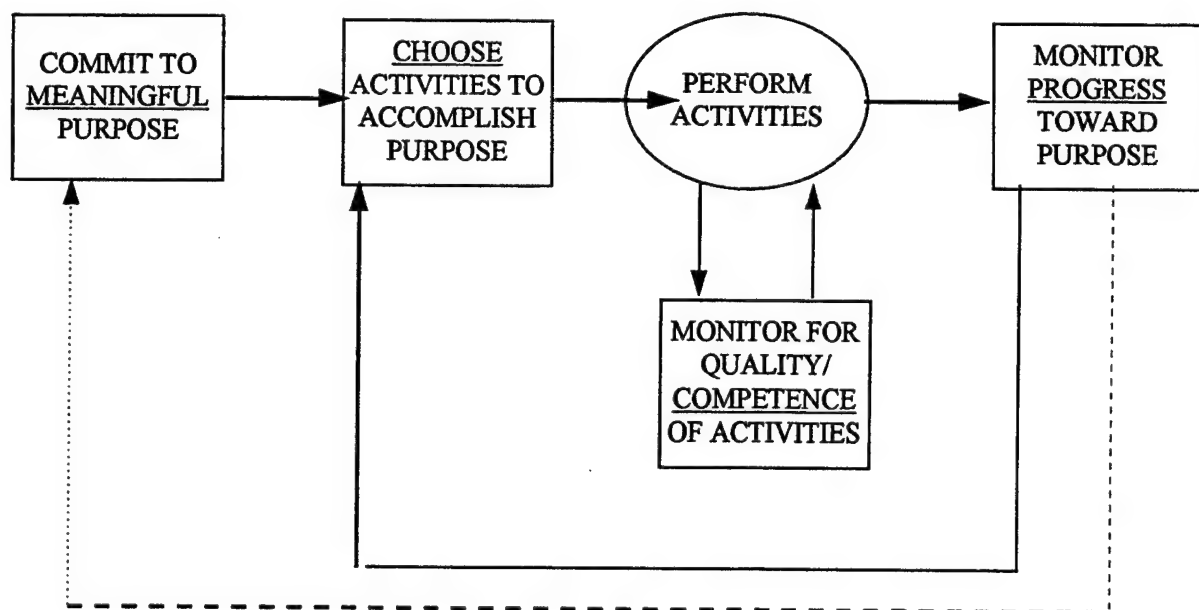


Figure 3. The Self-Management Process

As shown in Figure 3, the first critical step in self-management is individual commitment to a meaningful purpose. Committed workers, who have internalized the objectives of their organization as congruent with their own values and goals, can be

trusted to “stay the course” with minimal external management. Self-management typically presumes that workers can exercise their best judgment to choose which activities will accomplish their purpose. They may choose who to work with, how to schedule the work, which inputs to use, how to organize their environment, and how to perform their various tasks and subtasks. As activities are performed, workers monitor the quality or competence of their performance. This allows them to adjust their performance as needed, and, if necessary, to select other activities that can be performed better in that situation. Finally, self-managing workers monitor their own progress toward the task purpose, and this, in turn, enables them to adjust their choice of activities if needed. Judgments of progress also serve to reinforce and strengthen their resolve and commitment to the purpose.

As implied in the above discussion, self-management is accompanied by a great deal of problem-solving on the part of the worker. Committed, self-managing workers make ongoing adjustments to events in order to accomplish their task purpose. This problem-solving and adjusting has been described as flexibility, adaptation, responsiveness, innovation, and other terms. All these words refer to the applied worker judgment and intelligence harnessed in the self-management process.

VII. POTENTIAL EFFECTS OF INTRINSIC MOTIVATION IN THE MILITARY

Figure 4 spells out major potential benefits of intrinsic motivation in the military, examined at the levels of individuals, their units, and the larger organization (branch of service). As discussed earlier, intrinsic motivation is hypothesized to have a strong, direct effect on individual self-management, and vice versa. So one important stream

of hypothesized effects occurs through increased self-management and its effects (shown along the lower row of variables). At the same time, the intrinsic rewards that are at the heart of intrinsic motivation have another series of effects through retention (shown along the upper row). Further, retention effects are shown to combine with self-management effects to increase performance and readiness.

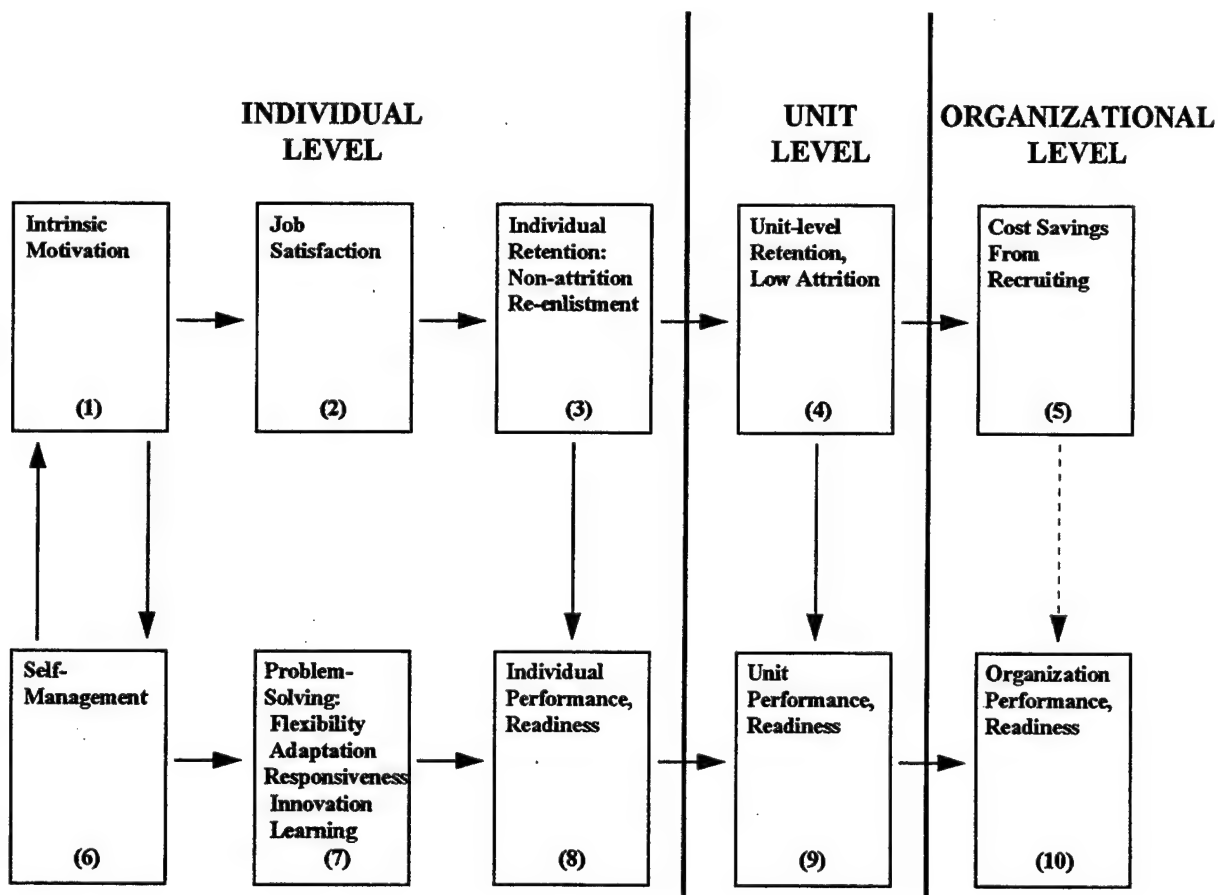


Figure 4. Potential Effects of Intrinsic Motivation in the Military

A. Individual-Level Effects

The effects of intrinsic motivation on job satisfaction and retention are relatively well understood and documented. The effects of intrinsic motivation (1) on job satisfaction (2) is strong and occurs almost by definition—since intrinsic motivation is

defined in terms of rewarding (i.e., satisfying) experiences from job tasks. Intrinsic task rewards are thus one very important contributor to job satisfaction (along with non-task factors, such as relations with coworkers). Job satisfaction (2), in turn, has been shown to be a major factor in the individual's decision to remain in the military (3)--through both non-attrition and reenlistment.²

The potential effects of intrinsic motivation through self-management, on the other hand, have been less extensively studied and analyzed. As discussed above, intrinsic task motivation (1) involves the specific psychological rewards that individuals receive from the tasks on which they are engaged. These rewards reinforce the self-management behavior (6) that produces those psychological rewards. As noted earlier, the significance of self-management (in comparison with compliance) is that it produces spontaneous problem solving (7) by individuals. As shown in the Figure, this problem solving shows up in behaviors characterized by flexibility, adaptation, responsiveness, innovation, and learning. As we have argued above, the military environment is changing in ways that require increasing levels of these self-managing, problem-solving behaviors from its personnel. Thus, problem solving (7) is becoming increasingly important to individual performance on assigned tasks and readiness for actual missions (8).

As shown in the Figure, individual retention (3) also is a contributor to individual performance and readiness (8). That is, when individuals remain longer, they tend to learn additional skills and gain further mastery over their tasks.

B. Unit-Level Effects

At the unit level, the aggregated effects of individual retention (3) produce an increase in unit-level retention levels and low attrition (4). While some attrition is inevitable and desirable at the unit level, intrinsic motivation is seen as reducing the level of voluntary losses that are costly to the unit. (Involuntary separations based on disciplinary problems or poor performance stemming from low intrinsic motivation would also be reduced somewhat.)

Likewise, the aggregated effects of individual performance and readiness (8) produce an increase in unit performance and readiness (9) by supplying a force of personnel who are able to deal effectively with conditions the unit will encounter. As shown in the Figure, unit-level retention (4) is also seen as contributing to unit performance and readiness (9) beyond the increase in the readiness of individuals.³ That is, in units with more stable membership, readiness is also likely to increase through the greater cohesiveness, trust, and established working relationships that come with more time together (Thomas, 1995).

C. Organization-Level Effects

At the organizational level, the aggregated effect of increased unit performance and readiness (9) is that the larger organization itself increases in performance and readiness (10). That is, its missions are carried out by more capable units.

In addition, the higher unit-level retention (4) would produce significant cost savings (5) for the larger organization, through reduced costs for recruiting and training. (In 1991, the GAO estimated a cost of \$40,000 to recruit and train a soldier.)

As shown by the dotted line in the Figure, these savings have the potential for reinvestment in other areas that contribute to readiness—including equipment, advanced training, and additional positions.

D. Final Comments and Recommendations

Figure 4, and the discussion above, have focused on the important potential benefits of intrinsic motivation in the military. We have presented an integrated theory of intrinsic task motivation, along with a model of the self-management process. These models clarify the intimate relationship between intrinsic task motivation and self-management. Figure 4 illustrates how intrinsic motivation generates -- through self-management -- a set of problem solving behaviors that correspond to the requirements being specified for military personnel in the twenty-first century.

Based upon this research, we recommend that intrinsic motivation be made a high priority for further study within DOD. We recommend continued model building, focused on identifying types of leadership that foster intrinsic motivation, as well as other causal factors. We also recommend systematic measurement of intrinsic motivation in the military, and tests of its relationship to unit retention and readiness. Finally, we recommend that issues of intrinsic motivation and self-management, as they evolve through further research, become explicitly incorporated into training and doctrine.

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ENDNOTES

¹ There have been twenty-five years of controlled, laboratory experiments on intrinsic motivation, typically involving college students playing games and solving game-like puzzles. By contrast, field research in work contexts that focuses on intrinsic *task* motivation is relatively scarce (cf. Cameron & Pierce, 1994; Deci, 1995).

² For evidence from the National Guard and Army Reserve, for example, see Bray and Theisen (1990), Hom (1979), and Thomas (1995). For a general review of military research, see Glaser and Dutcher (1994).

³ By "aggregated", we do not mean to suggest that unit level readiness results from a simple addition of individuals' readiness. Given the vertical and horizontal differentiation of organizations and the different roles individuals play with respect to the overall technology of the unit, the performance benefits of self-management almost certainly aggregate non-linearly.

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